

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

*Ex parte PAWEL W. SLEBODA, ROBERT J. TRUE
DAVID J. PRINCE and JEROME NG*

MAILED

AUG 23 2005

U.S. PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Appeal No. 2005-1795
Application No. 10/049,993

ON BRIEF

Before OWENS, BARRY, and MACDONALD, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from a rejection of claims 1-11, 13-23 and 25-45. Claims 12 and 24 stand objected to but allowable if rewritten in independent form. Claims 46-61 stand withdrawn from consideration by the examiner as claiming a nonelected invention.

THE INVENTION

The appellants claim a vehicle audio system which uses the vehicle's headliner as a speaker. Claim 1 is illustrative:

1. An audio system for use in a vehicle having a roof, the system comprising:

a headliner adapted to be mounted adjacent the roof so as to underlie the roof and shield the roof from view, the headliner having an upper surface and a sound-radiating, lower surface;

a source of audio signals;
an array of electromagnetic transducer assemblies supported at the upper surface of the headliner;
signal processing circuitry coupled to the assemblies for processing the audio signals to obtain processed audio signals wherein the assemblies convert the processed audio signals into mechanical motion of corresponding zones of the headliner and wherein the headliner is made of a material which is sufficiently stiff and low in density so that the headliner radiates acoustic power into the interior of the vehicle as a single speaker with a frequency range defined by a lower limit of 100 hertz or less and an upper limit of 12 kilohertz or more and the processed audio signals at a low end of the frequency range are matched to the processed audio signals at mid and high ends of the frequency range.

THE REFERENCES

References relied upon by the examiner

Marquiss	4,385,210	May 24, 1983
Watanabe	5,450,057	Sep. 12, 1995
Clark et al. (Clark)	5,754,664	May 19, 1998
House	5,887,071	Mar. 23, 1999
Azima et al. (Azima '029)	6,332,029	Dec. 18, 2001 (filed Sep. 3, 1996)
Warnaka et al. (Warnaka)	6,356,641	Mar. 12, 2002 (filed Sep. 25, 1996)
Azima et al. (Azima '490) (PCT application)	WO 99/11490	Mar. 11, 1999

Reference relied upon by the appellants

David Macaulay, *The New Way Things Work* 228 (Houghton Mifflin 1998).

Appeal No. 2005-1795
Application No. 10/049,993

THE REJECTIONS.

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1, 9-11, 13, 15, 16, 35-38, 40, 41 and 45 over Warnaka in view of Clark; claims 2-4, 14, 17 and 43 over Warnaka in view of Clark and House; claims 5-8 over Warnaka in view of Clark and Marquiss; claims 18-23 and 25-34 over Warnaka in view of Clark and Azima '490; claim 39 over Warnaka in view of Clark and Watanabe; and claims 42 and 44 over Warnaka in view of Clark and Azima '029.¹

OPINION

We affirm the aforementioned rejections. Under the provisions of 37 CFR § 41.50(b) we enter a new ground of rejection of claims 12 and 24.

The appellants state that the claims stand or fall together (brief, page 5). Although additional references are applied to many of the dependent claims, the appellants do not argue the separate patentability of those claims. We therefore limit our discussion to one claim, i.e., claim 1, which is the sole

¹ A provisional obviousness-type double patenting rejection of claims 1-45 over claims 1-41, 43 and 44 of copending application 09/382,851 in the most recent rejection (mailed July 14, 2004) is not included in the examiner's answer. This rejection apparently has been withdrawn by the examiner in view of a terminal disclaimer filed on August 30, 2004.

Appeal No. 2005-1795
Application No. 10/049,993

independent claim. See *In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c) (7) (1997).

Warnaka discloses a loudspeaker system which "comprises a transducer capable of being excited by applied electric potential and a diaphragm that is driven by the excited transducer, with the diaphragm being comprised of the headliner of the vehicle" (col. 2, lines 6-11). The headliner has a stiffness sufficient for it to function as a speaker diaphragm which radiates sound into the vehicle (col. 3, line 35 - col. 4, line 36). The loudspeaker system can be used with conventional speaker systems (col. 11, lines 31-35).

Clark discloses a vehicle audio system including 1) full range speakers (18-25) which preferably are mounted directly to the vehicle's headliner and have a frequency range of 80 to 20,000 Hz, 2) wolfers (26 and 27) which are mounted in the front door panels or under the instrument panel and have a frequency range of 85 to 3,000 Hz (col. 3, line 66 - col. 4, line 4), and 3) sub-wolfers which preferably are positioned on the rear package tray behind the rear seats of the vehicle and have a frequency range below 60 Hz or 85 Hz (col. 4, lines 4-7; col. 5, lines 1-15). Clark discloses:

[I]n one reduction to practice the frequency range of the signal for driving speakers **28** and **29** is below 80 Hz, and does not include a signal delay. The signals driving wolfers **22** and **23** has a frequency range of 80 Hz to 3,000 Hz, and do not have a signal delay. The signals driving speakers **18-25** have a low frequency cutoff of approximately 150 Hz. The signals thus have a frequency range from 150 Hz up to approximately 20,000 Hz. The signals input to speakers **18** and **20** are delayed 10 milliseconds. The signals input to speaker **19** are delayed 8 milliseconds. The signals input to speakers **21, 23, 24** and **25** are delayed 20 milliseconds. The signals input to speaker **22** are delayed 5 milliseconds. [col. 8, line 62 - col. 9, line 7]

* * *

Additionally, the signals input to the overhead speakers **16-25** have a controlled delay according to the position of the speaker in the vehicle. This delay, together with placement of the speaker effect synchronization and three-dimensional directionality to define a desired ambiance. The equalization and amplification of the signals for each speaker effects a uniform frequency characteristic for each speaker over the desired frequency range output by each speaker in the system. [col. 9, lines 48-56]^[2]

The appellants argue that Warnaka discloses transducers which are flat piezoelectric elements (col. 5, lines 16-19) and discusses deficiencies in other types of transducers (col. 11, lines 15-28) (brief, page 6; reply brief, page 2). Warnaka discloses that compared to the other disclosed transducers,

² The appellants indicate that the matching of the audio signals at a low end of the frequency range to the processed audio signals at mid and high ends of the frequency range required by claim 1 is obtained by delaying audio signals fed to speakers (specification, page 19, lines 5-11).

piezoelectric transducers are preferred because they are much thinner and lighter, run cooler, and are more economical (col. 11, lines 20-27). References, however, are not limited to their preferred embodiments. See *In re Kohler*, 475 F.2d 651, 653, 177 USPQ 399, 400 (CCPA 1973); *In re Mills*, 470 F.2d 649, 651, 176 USPQ 196, 198 (CCPA 1972); *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969). Instead, all disclosures in a reference must be evaluated for what they would have fairly suggested to one of ordinary skill in the art. See *In re Boe*, 355 F.2d 961, 965, 148 USPQ 507, 510 (CCPA 1966). Warnaka discloses that the transducer may be an electromagnetic transducer (col. 11, lines 17-18). Hence, the use of an electromagnetic transducer would have been *prima facie* obvious to one of ordinary skill in the art.

The appellants argue that Warnaka does not provide an enabling disclosure of an embodiment that uses an electromagnetic transducer (brief, page 6; reply brief, page 2). The appellants, however, have provided no evidence or technical reasoning which shows that one of ordinary skill in the art would not have been able to use Warnaka's electromagnetic transducer. The appellants have merely provided attorney argument to that effect, and such argument cannot take the place of evidence. See *In re De Blauwe*,

Appeal No. 2005-1795
Application No. 10/049,993

736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); *In re Payne*, 606 F.2d 303, 315, 203 USPQ 245, 256 (CCPA 1979); *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978); *In re Pearson*, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974).

The appellants argue that Macaulay illustrates the difference between Clark's loudspeakers and the appellants' electromagnetic transducers that convert audio signals into mechanical motion of corresponding zones of a headliner (brief, pages 7-8). Macaulay discloses how loudspeakers work, but does not mention headliners.

The appellants argue that the examiner fails to recognize the problem solved by the appellants (brief, page 11). To establish a *prima facie* case of obviousness, references need not be combined for the purpose of solving the problem solved by the appellants. See *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996); *In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); *In re Dillon*, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990) (*en banc*), cert. denied, 500 U.S. 904 (1991); *In re Lintner*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Warnaka's disclosure of using electromagnetic transducers to excite a vehicle's headliner such

that it functions as a diaphragm of a speaker system (col. 11, lines 17-18), and Clark's disclosure of using loudspeakers in a vehicle headliner (col. 3, lines 64-66) would have fairly suggested, to one of ordinary skill in the art, using Clark's loudspeakers as Warnaka's electromagnetic transducers.

The appellants argue that the examiner has failed to provide evidence that when a speaker is mounted on a headliner and the speaker produces sound, a portion of the sound energy is transferred to the headliner, effectively driving the headliner such that the headliner functions as the speaker's diaphragm (reply brief, page 3). Clark, the appellants argue, teaches that the air space between the headliner and the roof dissipates sound propagating radially outwardly from each speaker mounted to the headliner (col. 6, lines 42-50) (reply brief, page 3). Warnaka teaches that the transducer drives the headliner such that it acts as the diaphragm of a speaker system and that the transducer can be an electromagnetic transducer (col. 2, lines 6-11; col. 11, lines 17-18). Thus, the applied references would have fairly suggested, to one of ordinary skill in the art, using Clark's speaker as Warnaka's electromagnetic transducer to drive the headliner such that it acts as the diaphragm of a speaker.

Appeal No. 2005-1795
Application No. 10/049,993

For the above reasons we conclude that the audio system claimed in the appellants' claim 1 would have been obvious to one of ordinary skill in the art over the applied prior art. Accordingly, we affirm the rejection of that claim and claims 2-11, 13-23 and 25-45 that stand or fall therewith.

New ground of rejection

Claims 12 and 24 are rejected under 35 U.S.C. § 103 as being unpatentable over Warnaka in view of Clark.

Claim 12, which depends from claim 1, requires that the headliner material has a flexural modulus between 1E7 PA and 4E9 PA and a density between 100 and 800 kg/m³. Claim 24, which also depends from claim 1, requires that the headliner material has a flexural modulus between 1E7 PA and 4E9 PA and a density between 100 and 800 kg/m³, and states that the headliner material may be made from a single material or composites.

Warnaka does not disclose the flexural modulus or density of the headliner. Consequently, one of ordinary skill in the art would have determined through routine experimentation the flexural modulus and density required for Warnaka's headliner to perform its intended function of radiating acoustic power into the interior of a vehicle. Because, similarly to the appellants' preferred headliner which is made of rigid foam (specification,

page 19, lines 25-25), Warnaka's headliner may be made of rigid foam layers between inextensible layers (col. 3, line 60 - col. 4, line 11), and because the headliners of both Warnaka and the appellants are to have properties that render them useful for the same purpose of radiating acoustic power into the interior of a vehicle, it reasonably appears that the flexural moduli and densities of Warnaka's headliner determined by one of ordinary skill in the art through routine experimentation would include values within the very broad ranges used by the appellants and recited in the appellants' claims 12 and 24. For this reason and the reasons given above with respect to claim 1, the audio systems claimed in claims 12 and 24 would have been obvious to one of ordinary skill in the art over the combined disclosures of Warnaka and Clark.

DECISION

The rejections under 35 U.S.C. § 103 of claims 1, 9-11, 13, 15, 16, 35-38, 40, 41 and 45 over Warnaka in view of Clark, claims 2-4, 14, 17 and 43 over Warnaka in view of Clark and House, claims 5-8 over Warnaka in view of Clark and Marquiss, claims 18-23 and 25-34 over Warnaka in view of Clark and Azima '490, claim 39 over Warnaka in view of Clark and Watanabe, and claims 42 and 44 over Warnaka in view of Clark and

Appeal No. 2005-1795
Application No. 10/049,993

Azima '029, are affirmed. A new ground of rejection of claims 12 and 24 has been entered under 37 CFR § 41.50(b).

In addition to affirming the examiner's rejection(s) of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 CFR § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

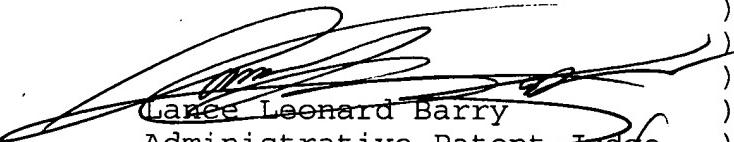
Should the appellant elect to prosecute further before the examiner pursuant to 37 CFR § 41.50(b)(1), in order to preserve

Appeal No. 2005-1795
Application No. 10/049,993

the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If the appellant elects prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

AFFIRMED, 37 CFR § 41.50(b)

Terry J. Owens)
Terry J. Owens)
Administrative Patent Judge)

Lane Leonard Barry) BOARD OF PATENT
Administrative Patent Judge)

Allen R. MacDonald)
Administrative Patent Judge)


TJO/eld

Appeal No. 2005-1795
Application No. 10/049,993

Brooks, Kushman P.C./Lear Corporation
1000 Town Center
Twenty-Second Floor
Southfield, MI 48075-1238